Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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FLUKE®

PM 3370B, PM 3380B, PM 3384B, PM 3390B and PM 3394B

Technical Data

CombiScope® Instruments

TEST EQUIPMENT SOLUTIONS
Quality Second User Test Equipment for Sale or Rental
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Autoranging DSO with a built-in analog oscilloscope
This range of instruments comprises a total of 5 models. All are digital storage oscilloscopes with a real-time analog oscilloscope built-in. They are equipped with screen read-out, cursors and a fullly triggered delayed timebase. They can be switched to the familiar analog mode, giving all the advantages of a real time signal display, from the digital mode and back, at the push of a button.

For optimum user convenience, this can be done from the front panel or from the probe-mounted command switch. The digital mode offers unique AUTORANGING capabilities for all channels as well as for the timebase. Autoranging allows for hands-free operation of the scope, with continuously optimized settings matching the signals applied.

All DSO benefits apply: trace storage, pre-trigger view, calculated measurements, hardcopy facilities, advanced trigger modes, averaging and FFT. The probe operated Touch-Hold-and-Measure™ freezes the display and instantly displays measured signal parameters V_{DC}, V_{RMS}, V_{pk-pk} and frequency.

Autoranging
Continuously adjusts the vertical deflectionfactor and the timebase sweep speed to keep an optimum display of the input signals. Autoranging can be selected individually for each of the input channels and for the timebase (responding to trigger signal).

Continuously variable timebase
Unique variable timebase works in both the DSO mode (down to 1 µs/div.) as well as in analog mode. When combined with autoranging, the variable timebase will keep a fixed number of cycles of the input waveform on screen, even with changing input signal frequency. This is ideal when looking at frequency dependent phenomena, or when used with rotating machines and engines.

Autoset
Selects proper channel-, timebase- and trigger settings for all channels, including the PM 3370B's, PM 3380B's and PM 3390B's external trigger input. Triggering is automatically on the lowest frequency input signal. The function can be customized by the user to support personal preferences in the set-up.

Fast sampling
The sampling technique used in these instruments, gives a sample rate of up to 25 GS/s in PM 339xB for repetitive signals (10 GS/s in the other models). This results in a time resolution of 40 ps for the PM 339xB (100 ps for the other models). The single shot sample rate of 200 MS/s is also applied in the digital oversampling peak-detect mode, to capture fast transients and spikes as narrow as 5 ns at correct amplitude. At any timebase setting !

Autocal
Automatic fine adjustment for enhanced accuracy to get optimum performance even under extreme environmental conditions.

Automatic testing
The additional pass / fail testing offered by the Math+ option, as well as the GPIB/IEEE-488.2 interface make these scopes a powerful and fully programmable tool in automatic test applications.

Memory
The 8K record length is optionally expandable to 32K samples for one trace, or up to 200 traces in memory at 512 samples per trace. And it's even standard on the PM 33x4B.

Technical Specifications

ANALOG MODE

VERTICAL DEFLECTION

Input channels
Full attenuator control on all four input channels (PM 33x4B), or on both input channels (PM 33x0B). External trigger input signal can be displayed for "trigger view" (PM 33x0B). On screen channel identifiers with ground level indicator.

Display modes
PM 33x4B: CH1, +/- CH2, CH3, +/- CH4, Add, Subtract; Alternate or chopped automatically selected.

PM 33x0B: CH1, +/- CH2, Add, Subtract; External Trigger View; Alternate or chopped automatically selected.

Bandwidth (+5..... +40°C)
PM 339xB: >200 MHz @ -3 dB,
PM 338xB: >100 MHz @ -3 dB,
PM 3370B: > 60 MHz @ -3 dB.

Bandwidth limiter
20 MHz @ -3 dB on all fully controllable channels simultaneously.

Rise time
(calculated from the bandwidth)
PM 339xB: < 1.75 ns,
PM 338xB: < 3.5 ns,
PM 3370B: < 5.8 ns.

Deflection Settings
Step attenuator:
2 mV/div..... 5V/div. in a 1-2-5 sequence (full bandwidth).
Calibrated vernier:
2 mV/div.... 12.5 V/div.

External Trigger View (PM 33x0B):
100 mV/div. and 1 V/div.

Error limits
1.3% (measured over central 6 divisions).

Input impedance
All models, all channels:
1 MΩ ± 1% // 25 pF ± 2 pF
PM 339xB: user selectable 50Ω ± 1%.

Max. rated input voltage
In 1 MΩ position: ±150 V_{RMS} CAT II
In 50Ω position: dc:±5 V, rms: 5 V, ACpeak:±50 V.

Dynamic range
PM 339xB: 24 div. at 50 MHz
PM 338xB: 24 div. at 25 MHz
PM 3370B: 24 div. at 15 MHz

CMRR
100:1 at 1 MHz, 25:1 at 50 MHz.

Channel isolation
PM 339xB: 50:1 at 200 MHz
PM 338xB: 50:1 at 100 MHz
PM 3370B: 50:1 at 60 MHz

HORIZONTAL
(Main and Delayed Timebase)

Display modes
Main Timebase (MTB),
Delayed Timebase (DTB),
Alternate Timebase (= MTB and DTB),
X-Y mode.

Sweep speeds (magn. x1)
PM 339xB: MTB: 0.5 s/div..... 20 ns/div. in a 1-2-5-sequence. Calibrated vernier gives 1.25 s/div..... 20 ns/div. DTB: 0.5 ms/div... 20 ns/div. in a 1-2-5 sequence.
PM 338xB and PM 3370B: MTB : 0.5 s/div.... 50 ns/div. in a 1-2-5-sequence. Calibrated vernier gives 1.25 s/div ..... 50 ns/div. DTB: 0.5 ms/div... 50 ns/div. in a 1-2-5-sequence.

Fastest sweep speed (magn. x10)
PM 339xB: 2 ns/div.
PM 338xB and PM 3370B: 5 ns/div.

Error limit (magn. x1)
≤ [1.3% of reading + 0.5% of 8 divisions].

DELAY TIME MULTIPLIER

Resolution
1 : 40,000

Error limit (magn. x1)
≤ [0.8% of reading + 0.3% of 8 divisions + 4 ns].

Jitter
< 1 : 25,000

TRIGGERING
(Main and Delayed timebase)

Trigger modes
Auto free run, Triggered, Single; Edge triggering, TV Triggering.

EDGE TRIGGERING

MTB trigger source
PM 33x4B: CH1.... CH4, Line. External trigger input optional, replacing "Line".
PM 33x0B: CH1, CH2, External, Line.

DTB trigger source
Starts after delay or triggered on any channel or on External Trigger input (PM 33x0B only).

Slope
Positive (+), Negative (-).

Coupling
DC, AC (<10 Hz), LF-rej. (30 kHz), HF-rej. (30 kHz).

Trigger gap
0.4 div., user selectable 0.8 div. for triggering on noisy signals.

Level range
± 8 div. or automatically within signal peak-peak amplitude range.

Level indication
On screen level indicators and numerical read-out.

Trigger sensitivity and bandwidth
(+5..... +40°C)

Sensitivity	PM3370B	PM338xB	PM339xB
0.6 div.	30 MHz	50 MHz	100 MHz
1.2 div.	60 MHz	100 MHz	200 MHz
2.0 div.	150 MHz	200 MHz	300 MHz

TV Triggering

MTB trigger source
PM 33x4B: CH1.... CH4; Lines, Field 1, Field 2, specific line using built-in line counter. External trigger input optional, replacing "Line"
PM 33x0B: CH1, CH2, Ext.; Lines, Field 1, Field 2, specific line using built-in line counter.

Video standard
NTSC, PAL, SECAM, HDTV.

Delayed TB trigger source
Starts after delay or triggered on any input channel or on External Trigger input (PM 33x0B only); DTB triggers on edge or on TV line. The Delayed TB can be used to expand any part of the line selected with the video line selector.

Signal polarity
Positive or negative video.

Sensitivity
0.7 div. (amplitude of sync. pulse).

X-Y MODE

X-deflection source
PM 33x4B: CH1.... CH4, Line.
PM 33x0B: CH1, CH2, External, Line.

X-deflection coefficient
Same as for vertical deflection, error limit 5% over central 6 div.

Dynamic range
20 div. up to 100 kHz,
> 10 div. up to 2 MHz.

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ANALOG MODE (cont.)

Frequency response
≥ 2 MHz @ –3 dB.
Phase shift < 3° up to 100 kHz.

CURSOR MEASUREMENTS

Cursor modes and Read-out
Vertical: dV, V1 to ground, V2 to ground, ratio.
Horizontal: dT, 1/dT (in Hz), ratio, phase.
Horizontal and vertical cursors can be used together.

Accuracy (magn. x1)
± 1% of full scale within the central 8 horizontal and 6 vertical divisions.

DIGITAL MODE

ACQUISITION

Repetitive Sample Rate
Random sampling gives an equivalent sample rate up to 25 GS/s (PM 339xB) or up to 10 GS/s (PM 3370B and PM 338xB) on all input channels, over the full bandwidth.

Single Shot Sample Rate
Real time sampling up to 200 MS/s (single channel), 100 MS/s (dual channel).
In PM 33x4B, a fast chopper offers 200 ns horizontal resolution in 4 channel single shot mode.

Bandwidth (+5..... +40°C)
PM 339xB: 200 MHz (repetitive and single shot)
PM 338xB: 100 MHz (repetitive and single shot)
PM 3370B: 60 MHz (repetitive and single shot)

Calculated Maximum Captured Frequency in single shot mode
- Using sine interpolation to reconstruct signals at 5 samples per period:
  40 MHz in 1 channel mode,
  20 MHz in 2 channel mode,
  1 MHz in 4 channel mode or when trigger view (PM 33x0B) is active.
- For 10 samples per period with linear interpolation:
  20 MHz in 1 channel mode,
  10 MHz in 2 channel mode,
  0.5 MHz in 4 channel mode or when trigger view (PM 33x0B) is active.

ADC Resolution
ADC resolution 8 bit, Memory resolution 16 bit. All mathematical operations and averaging increase waveform resolution beyond 8 bits.

Memory
Memory resolution 16 bit; Acquisition and reference memory can be segmented offering the choice between long acquisition records or a maximum screen update rate and a maximum number of traces in memory. See table for full details on acquisition length selections and total number of traces that can be stored in back-up memory. Figures include the MTB acquisition memory as well as DTB acquisition memory (available with 512 samples acquisition length only).

Record length and trace storage

PM 3394B, PM 3384B				
Acquisition length	1 CH x 32K	2 CH x 16K	4 CH x 8K	4 CH x 512s
Trace storage	3 traces	6 traces	12 traces	208 traces
PM 3370B, PM 3380B and PM 3390B with Standard memory				
Acquisition length	1 CH x 8K	2 CH x 4K	2 CH + Tr.View x 2K	2 CH + Tr.View x 512s
Trace storage	3 traces	6 traces	9 traces	30 traces
PM 3370B, PM 3380B and PM 3390B with Expanded Memory option				
Acquisition length	1 CH x 32K	2 CH x 16K	2 CH + Tr.View x 8K	2 CH + Tr.View x 512s
Trace storage	3 traces	6 traces	9 traces	156 traces

Averaging
Averaging reduces random noise contained in the signal, while increasing the vertical resolution. Averaging factor user selectable: 2, 4, 8, ... 4096; Max. resolution: 14 bit.

Peak detection
Captures glitches as narrow as 5 ns at any timebase setting (single channel) or 10 ns (dual channel and multiple channel, alternating) and at correct amplitude. Also very useful to capture high-frequency components (like a modulated carrier) at low timebase settings.

Envelope mode
For continuous tracking of changing waveforms.

VERTICAL

Same as analog mode, unless specified otherwise.

Auto-ranging vertical deflection
Automatically and continuously adapts vertical deflection setting to have 2.... 6.4 division display of input signal. Can be selected on any input channel individually. Minimum deflection setting automatically selected is 50 mV/div.

Vertical Magnification
Up to 32x magnification for higher deflection sensitivity; can be combined with averaging for increased resolution (averaging factor selectable up to 4096x resulting in a vertical resolution of 14 bit).

Display modes
PM 33x4B: CH1, +/- CH2, CH3, +/- CH4; Calculated Add and Subtract.
PM 33x0B: CH1, +/- CH2; Calculated Add and Subtract. External Trigger Input signal can be displayed acting as a third input channel.

Bandwidth limiter
20 MHz @ –3 dB.

Window mode
2 or 4 windows to display two or four traces above each other while using the full dynamic range of the ADC (8 bit).

HORIZONTAL

Acquisition modes
Recurrent (Auto and Triggered), Single Shot, Multiple single shot (as part of Math+ option), Roll, Triggered Roll. User selectable AUTO-RANGING timebase in recurrent modes.

X-Y mode
X-source: any trace in memory or any of the input channels.

AUTO-RANGING timebase
Continuously adapts sweep speed to the frequency of the trigger signal in order to keep 2..... 6 cycles on screen; User selectable function. Autoranging Timebase can work with timebase in 1–2–5 range or with continuously variable timebase, stabilizing the number of cycles on screen.

Timebase modes
Main TB (MTB), Delayed TB (DTB), Alternate TB (= MTB and DTB).
Delayed timebase starts after delay or triggered on channel. Trigger coupling: same as for analog mode.

Timebase (magn. x1)
Real time sampling: 200 s/div.... 500 ns/div., 250 ns/div.
Recurrent: 200 ns/div..... 2 ns/div. (5 ns/div. for PM 338xB and PM 3370B)
Roll mode: 200 s/div..... 50 ms/div.

Variable timebase
Continuously variable sweep speed: 1 µs/div.... 500 ms/div. in 1 µs increments; 500 ms/div.... 200s/div. better than 0.2% increments.

Display resolution
Horizontal resolution (per trace) for x1 magnification: 500 samples = 10 divisions = 1 screen width. Compression allows a compact display of larger records.

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DIGITAL MODE (cont.)

Magnification
x2, x4, ... x32 (expansion) of any part of a record;
x1/2, x1/4, ... x1/64 (compression) of records exceeding 512 samples.

Interpolation
- Dots only (shows acquired samples only).
- Linear interpolation.
- Sine interpolation (offers natural representation of expanded single shot acquisitions up to <10 ns/div.).

TRIGGERING

Edge triggering
Same as for analog mode, plus dual slope triggering when used in single shot, real time only mode.

TV triggering
Same as for analog mode.

Logic triggering modes
State (4 bit), Pattern (4 bit), Glitch (time qualified pulse).
- **State triggering** (PM 33x4B only)
  Any of the 4 channels can be selected as the clock. Each of the other channels can be monitored for being "high", "low" or "don't care". The scope triggers if the combination of the remaining channels matches the user defined description during a transition (+ or –, user selectable) of the clock.
  Max. clock rate: 150 MHz typical.
  Sensitivity: 1.0 div. if time present ≥ 10 ns (≥ 20 ns for PM 3384B), 2 div. if time present ≥ 2 ns (≥ 4 ns for PM 3384B).
- **Pattern triggering** (PM 33x4B only)
  The scope triggers if the combination of the four channels matches the user defined description. Each channel can be monitored for being "high", "low" or "don't care".
  Modes: Enter, Exit, Time qualified (lower limit, upper limit, range).
  Range of limits: 20 ns.... 167.7 ms;
  Smallest resolution: 10 ns;
  Sensitivity: 1.0 div. if time present ≥ 10 ns, (≥ 20 ns for PM 3384B), 2 div. if time present ≥ 2 ns, (≥ 4 ns for PM 3384B).
- **Glitch triggering** (all models)
  Minimum glitch width:
  2 ns (4 ns PM 339xB), 4 ns (PM 338xB) or 6 ns (PM 3370B).
  Pulse width time qualification:
  lower limit, upper limit, range.
  Limits must be in the range 20 ns... 167.7 ms; Smallest resolution 10 ns.

DELAY

Time delay
0.... 1000 div., continuously adjustable.
Pre-trigger view
Up to 1 full record (= 160 div. for an 8K record, or 640 div. for a 32K memory)

Event delay
1.... 16384 events;
Max. count rate 50 MHz (typical);
Source: any channel (including External Trigger on PM 33x0B); Modes: Event delay, Time delay after event delay.

Delay modes
Start after time delay, Wait for trigger after time delay.

CURSOR MEASUREMENTS

Cursor modes
Horizontal, Vertical, Both; Free or coupled to trace. Cursors can be used throughout the memory.

Read-out

Vertical:	dV, V1 to ground, V2 to ground, dVratio
Horizontal:	dT, 1/dT (in Hz), T1&T2 to trigger moment, dTratio, phase.

For phase measurements, the cycle is automatically referenced to trigger signal.

CALCULATED MEASUREMENTS

General
Measurements can be performed over a complete record or within a cursor limited area. Statistics mode provides minimum, mean and maximum measurement result per measurement.

Volt
DC, RMS, Minimum, Maximum, Peak to Peak, Low level, High level, Overshoot (pos. or neg.), Preshoot (pos. or neg.).

Time
Frequency, Period, Pulsewidth, Rise time, Fall time, Duty cycle.

Delay
Between channels; Rising and falling edges independently selectable.

Quick Measurement
Probe mounted "Command Switch" operates 'Touch, Hold and Measure', giving calculated measurements of frequency, V_{DC}, V_{RMS} and V_{pkpk}.

PROCESSING

Standard
Add, Subtract, Multiply, Digital filter (for noise reduction and increased resolution by means of digital low pass filtering after single shot capture).

In Math+ option
Integrate, Differentiate, FFT, Histogram.

GENERAL

INTERFACING

RS-232C SERIAL INTERFACE

Interface installed as a standard. Enables printing and plotting as well as full remote control of the instruments. Also allows for serial communication trace dump to arbitrary waveform generator.
DB-9 male connector.

Handshake
DSR/DTR, CTS/RTS, or Xon/Xoff.

Baudrate
75.... 19k2 full duplex, 38k4 dump only.

Format
1 stopbit; 7 or 8 databits; odd/even/no parity.

Protocol
CPL = Compact Programming Language; A reduced set of powerful instruction for full remote control through RS-232C.

Waveform dump
Trace dump to PM 5150, PM 5138A and PM 5139 arbitrary waveform generator (requires generator to be equipped with RS-232C interface).

GPIB/IEEE-488.2 INTERFACE

Factory installed option (next to RS-232C). Remote control conform SCPI (Standard Commands for Programmable Instruments) = standardized protocol. Fully compatible with IEEE-488.2.

Waveform dump
Trace dump to PM 5150, PM 5138A and PM5139 arbitrary waveform generator (requires generator to be equipped with IEEE interface).

HARDCOPY

Using RS-232C (standard) or GPIB/IEEE-488.2 (optional) interface. Centronics output optionally available through PAC33 Print Adapter Cable, giving RS-232 to Centronics conversion.

Output
Printed or plotted hardcopy of the screen (digital mode) in sizable format. If selected, with status report of the complete instrument setting and date- and timestamp of the trigger moment and the moment the hardcopy action was started. Two lines of on-screen text (32 characters per line) can be added for user documentation.

Printers
9 pin matrix printers (FX-80 compatible), 24 pin matrix printers (LQ-1500 compatible), ThinkJet (HP2225) and compatibles, HP LaserJet (series II & III) and compatibles incl. HP DeskJet, HP540 DeskJet compatibles.

Plotters
HP7440, HP7470A, HP7475A, HP7550, standard HPGL, PM8277, PM8278 and compatibles. HPGL file format is recognized by most drawing- and wordprocessor packages for direct inclusion of screen plots in documents, reports etc.

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Camera
Camera kit including bezel adapter available as optional accessory.

MISCELLANEOUS

Setting Memory
10 complete instrument set-ups, with battery back-up.

Probe adjustment output
600 mV peak-peak (± 1%), 2 kHz (± 20%) squarewave.

Z-modulation input
BNC, 10 kΩ, < 0.5V unblanked, >2.4 V blanked (in analog mode only).

Time between calibrations
2000 hours or 1 year with error limits specified. 4000 hours or 2 years at double the error limits.

Probe
Automatic detection of probe attenuation factor using indication ring. Manually selectable scale factors are part of Math+ option. Probe mounted Command Switch for control of user selectable function: initiate Autoset, initiate Quick Measure function, switch from analog mode to Digital Storage mode or back, select setting from memory.

POWER SUPPLY

Line voltage
100.... 240V (± 10%) in one range.

Line frequency
50.... 400 Hz (± 10%).

Power consumption
115 W (130 W with all options installed).

MECHANICAL DATA

Fan
Proportionally regulated forced air.

Width x Height x Length
excluding handle and feet:
341 x 139 x 481 mm
(13.4 x 5.5 x 18.9 inch),
including handle and feet:
391 x 147 x 551 mm
(15.4 x 5.8 x 21.7 inch).

Weight
9.5 kg = 21 lb.

ENVIRONMENTAL DATA

Meets requirements of
MIL-T-28800D Type III, Class 3, Style D, Color R, as specified:
Temperature range
0°C..... +50°C (operating),
–40°C..... +70°C (storage).

Humidity
95% (storage).

Altitude
Max. 4.6 km = 15,000 ft (operating),
12 km = 40,000 ft (transport).

Vibration
Frequency 5.... 55 Hz;
Max. acceleration at 55 Hz: 30 m/s^2.

Shock
6 shocks along each axis, half sine wave, 6.... 9 ms, peak acceleration 400 m/s^2.

Bench handling
Meets MIL-STD-810, method 516, procedure V

EMI
VDE 0871 Grenzwertklasse B;
MIL-Std-461C: CE01 Part 2 (narrow band), CE03 Part 4, CS01 Part 2, CS06 Part 5 (300 V max.), RE01 Part 5 and 6, RE02 Part 2 (1 GHz max.).

Magnetic susceptibility
Deflection for extreme conditions:
<0.7 div/mT, tested at 1.42 mT peak-peak, 45.... 66 Hz, in any direction.

SAFETY

Meets requirements of
EN 61010-1 CAT II Pollution Degree 2, UL1244, CSA C22.2 No231, Low Voltage Directive 73/23/EEC.

ELECTROMAGNETIC COMPATIBILITY (EMC)

Meets requirements of
EMC directive 89/336/EEC:
emisson EN50081.1, susceptibility EN50082.1

Meets requirements of
MIL-STD-461C:
Part2 CE01 (narrow band), Part4 CE03
Part2 CS01, Part5 CS06 (limited to 300V)
Part5 and 6 RE01, Part2 RE02 (max. 1 GHz)

STANDARD ACCESSORIES

Included
- Two 10:1 probes with read-out and command switch, supporting full bandwidth and command switch (PM 9010/091 or PM 9020/091, or equivalent);
- Operating guide;
- Reference manual;
- Front cover;
- Power cord;
- Guide to mathematic functions and SCPI/IEEE manual when applicable;
- Two LR-6 (AA-size) batteries;
- Free service manual upon request.

OPTIONS

GPIB / IEEE-488.2 OPTION

Gives full remote control, as well as waveform data transfer. See "Interfacing" for further details.

EXPANDED MEMORY

Allows acquisition and storage of traces up to 32K samples or storage of up to 200 traces of 512 samples each. See table "Record length and trace storage" for details. The memory extension is part of the PM 33x4B as a standard, and is optional on the PM 33x0B.

MATH+ OPTION

Additional processing
Integrate, Differentiate, FFT, Histogram. FFT is equipped with Hamming, Hanning and rectangular window. Relative level (dB) or absolute signal level read-out (mV_{RMS}, dBm in 50Ω, dBm in 600Ω, dBmV).

Pass / Fail testing
- Tests waveforms against reference envelope (created internally using cursor controls, or externally in a PC);
- Tests calculated measurements against preset limits;
- Tests cursor measurement against preset limits.

Gives audible warning, hardware output signal, Locks, Saves waveform, Prints, or Plots if test fails. If connected to PC with FlukeView® CombiScope software running, consecutive failing waveform plots can be stored automatically in the PC for long term process monitoring.

Multiple single shot
Captures and stores in internal memory consecutive single shot acquisitions, with time and date stamps.
Max. number of single shots stored:
PM 33x4B: 200 traces
PM 33x0B with standard memory:
8 sets of up to 3 traces
PM 33x0B with expanded memory:
50 sets of up to 3 traces

Advanced cursors
Amplitude qualified cursors for timing measurements with time cursors automatically positioned at a signal level relative to the signals Max.peak, Min. peak, High level, Low level, or on absolute levels.

AUX OUTPUTS AND EXTERNAL TRIGGER INPUT

- Channel 1 output (20 mV/div. into 1 MΩ, 10 mV/div. into 50Ω)
- MTB Gate output (0 / 5V nominal, >3.7 ±1.3 V while MTB running); output impedance 1 kΩ.
- DTB Gate output (0 / 5V nominal, >3.7 ±1.3 V while DTB running); output impedance 1 kΩ.
- External Trigger input (BNC input on rear of the instrument). Input impedance 1 MΩ ±1% // 25 pF ± 5 pF. Trigger input sensitivity 200 mV at 10 MHz; Max. input voltage ± 400 V. (External Trigger input is part of the option with PM 33x4B only).

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ORDERING INFORMATION

Model numbers

PM 3370B	60 MHz two channel Autoranging CombiScope
PM 3380B	100 MHz two channel Autoranging CombiScope
PM 3384B	100 MHz full four channel Autoranging CombiScope
PM 3390B	200 MHz two channel Autoranging CombiScope
PM 3394B	200 MHz full four channel Autoranging CombiScope

Optional configurations

When ordering, select one of the following configuration options and add to the basic typenumber:

for PM 3370B, PM 3380B and PM 3390B:

/02n	Math+
/08n	Math+ + EM
/42n	IEEE-488 + Math+
/48n	IEEE + Math+ + EM
/93n	IEEE + Aux.Out. + Math+
/99n	IEEE + Aux.Out. + Math+ + EM

for PM 3384B and PM 3394B:

/08n	Math+ + EM
/48n	IEEE + Math+ + EM
/99n	IEEE + Aux.Out./Ext.Trig. + Math+ + EM

The 'n' specifies the power cord option. To order with your power cord, replace the 'n' according to the following table:

1	Universal Euro 230V/16A
3	Standard North American 120V/15A
4	UK 240V/13A
5	Switzerland 230V/16A
8	Australia 240V/10A

A choice of 5 models in Fluke Autoranging CombiScope series	PM 3370B	PM 3380B	PM 3384B	PM 3390B	PM 3394B
Bandwidth	60 MHz	100 MHz	100 MHz	200 MHz	200 MHz
Sample Rate for repetitive signals for single shot appl.	 10 GS/s 200 MS/s	 10 GS/s 200 MS/s	 10 GS/s 200 MS/s	 25 GS/s 200 MS/s	 25 GS/s 200 MS/s
Channels	2 + Ext.Trig.	2 + Ext.Trig.	4	2 + Ext.Trig.	4
Max. acquisition record (+ optional)	8K (32K)	8K (32K)	32K	8K (32K)	32K
Analog scope built-in	Yes	Yes	Yes	Yes	Yes
Autoranging	Yes	Yes	Yes	Yes	Yes
RS-232 interface	standard	standard	standard	standard	standard

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